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TO: EXAMINER HONG SOL CHO (ART UNIT 2662)

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DATE: February 21, 2006

NUMBER OF PAGES (INCLUDING COVER SHEET): 20

COMMENTS/INSTRUCTIONS:

Please see attached Appeal Brief for Application Serial No. 10/658,357.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS

In re Patent Application of: **CAIN ET AL.**	Examiner: **Hong Sol CHO**
Serial No. **10/658,357**	Art Unit: **2662**
Confirmation No. **2108**	
Filing Date: **SEPTEMBER 9, 2003**	
For: **MOBILE AD HOC NETWORK (MANET) PROVIDING INTERFERENCE REDUCTION FEATURES AND RELATED METHODS**	

APPELLANTS' APPEAL BRIEF

MS Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is Appellants' Appeal Brief together with the requisite $500.00 large entity fee for filing a brief. The Commissioner is hereby authorized to charge the requisite fee of $500.00 to Deposit Account No. **08-0870**. If any additional extension and/or fee is required, authorization is given to charge Deposit Account No. **08-0870**.

(1) Real Party in Interest

The real party in interest is Harris Corporation, assignee of the present application as recorded at reel 014488, frame 0507.

(2) Related Appeals and Interferences

At present there are no related appeals or interferences.

(3) Status of the Claims

Claims 1-22 are pending in the application, all of which being appealed herein.

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(4) Status of the Amendments

All amendments have been entered and there are no further pending amendments. A copy of the claims involved in this appeal is attached hereto as Appendix A.

(5) Summary of the Claimed Subject Matter

The invention is directed to a mobile ad hoc network (MANET) and related methods, and will be described with reference to page 9, line 6 through page 10, line 16 (paragraph Nos. 0026-0028), and page 19, line 25 through page 21, line 14 (paragraph Nos. 0051-0055) of the specification and drawing Figures 1-4, 10 and 11 (FIGs. 1 and 11 reproduced below).

As recited in independent Claim 1, the MANET **20** includes a plurality of mobile nodes **21-28** each including a wireless communications device **30** and a controller **31** connected thereto. In particular, the controller **31** operates in accordance with a multi-layer protocol hierarchy **32** for, at an upper protocol layer **33**, establishing a quality-of-service (QoS) threshold **101**, and, at least one intermediate protocol layer **34** below the upper protocol layer, determining whether a QoS metric for at least one selected route from at least one source mobile node falls below the QoS threshold **104**. Further, at a lower protocol layer **35** below the at least one intermediate protocol layer, the controller **31** cooperates with the wireless communications device **30** to determine the QoS metric **102** for the at least one selected route, receive data **111** from the at least one source mobile node **21** via the at least one selected route, and adjust signal reception gain **110**

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based upon a determination that the QoS metric has fallen below the QoS threshold.

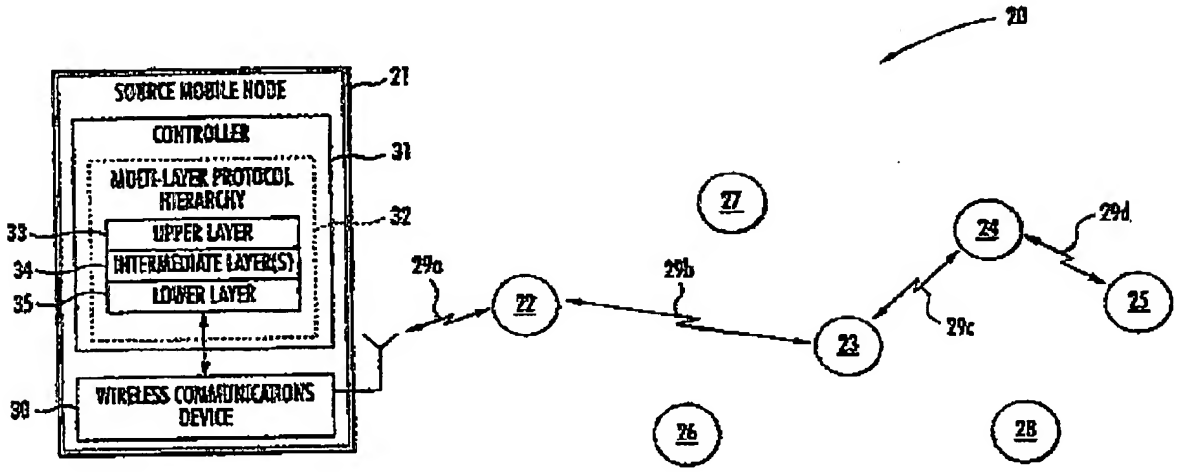

FIG. 1

Independent Claim 7 is also directed to a MANET **20** but includes the controller **31** cooperating with the wireless communications device **30** to adjust the signal reception pattern based upon a determination that the QoS metric has fallen below the QoS threshold.

Independent Claim 12 is directed to a method for operating a mobile node in a MANET **20**. The method includes at an upper protocol layer **33**, establishing a quality-of-service (QoS) threshold **101**, and, at least one intermediate protocol layer **34** below the upper protocol layer, determining whether a QoS metric for at least one selected route from at least one source mobile node falls below the QoS threshold **104**. Further, at a lower protocol layer **35** below the at least one intermediate protocol layer, using the wireless communications

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device **30** to determine the QoS metric **102** for the at least one selected route, receive data **111** from the at least one source mobile node **21** via the at least one selected route, and adjust signal reception gain **110** based upon a determination that the QoS metric has fallen below the QoS threshold.

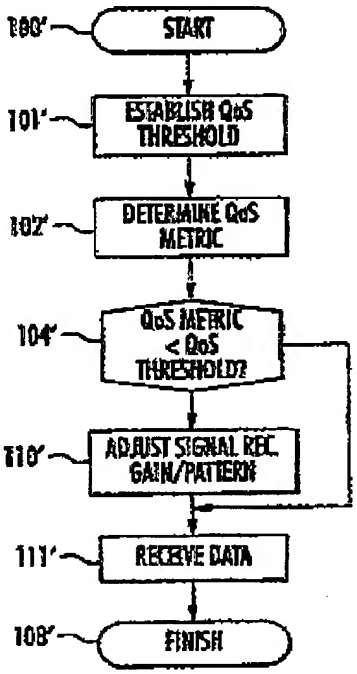

FIG. 11

Similarly, independent Claim 18 is also directed to a method for operating a mobile node in a MANET **20** but includes the wireless communications device **30** adjusting the signal reception pattern based upon a determination that the QoS metric has fallen below the QoS threshold.

As discussed in the specification, the nodes **21-28** may be any suitable type of mobile device capable of

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communicating within a MANET such as computers, personal data assistants (PDAs), etc. By way of example, the controller **31** may be implemented using microprocessors, memory, software, etc., as will be appreciated by those of skill in the art. Furthermore, the wireless communications device **30** may include wireless modems, wireless local area network (LAN) devices, cellular telephone devices, etc., as well as an associated antenna(s), as illustratively shown.

Data communications within MANETS typically follow the open system interconnection (OSI) architecture (or some variation thereof), as do other wireless networks (e.g., wireless LANs). By way of background, the OSI is a network protocol hierarchy which includes seven different control layers, namely (from highest to lowest) the application layer, presentation layer, session layer, transport layer, network layer, data link layer, and physical layer. Generally speaking, in the OSI model control is passed from one layer to the next at an originating node or terminal starting at the application layer and proceeding to the physical layer. The data is then sent across the network, and when it reaches the destination terminal/node, it is processed in reverse order back up the hierarchy (i.e., from the physical layer to the application layer).

In accordance with the present invention, the controller **31** similarly operates in accordance with a multi-layer protocol hierarchy **32** to provide an integrated framework for QoS operations. Generally speaking, the multi-layer protocol hierarchy includes an upper protocol layer **33**, one or more intermediate protocol layers **34**, and a lower protocol

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layer **35** over which complementary QoS operations are performed to provide enhanced QoS functionality.

(6) Grounds of Rejection to be Reviewed On Appeal

Claims 1-22 stand rejected under 35 U.S.C. § 102(e) as being unpatentable over Larson et al. (U.S. Publication No. 2003/0161268).

(7) Argument

The Examiner maintained the rejection of Claims 1-22 as being anticipated over U.S. Patent Publication No. 2003/0161268 to Larson et al. Appellants contend that Claims 1-22 clearly define over the cited reference, and in view of the following remarks, reversal of the rejection under 35 U.S.C. §102 is requested.

The Larson publication (FIG. 4 reproduced below) is directed to a cross-layer integration of functions on three or more protocol layers of a multi-hop network into a single unified mechanism. The protocol layers include the network layer, the link layer and the physical layer. Larson et al. teaches (at paragraph 0052) that "in effect, the unified approach of the invention partially or completely eliminates the need for a layered representation. Instead of having several separate optimization algorithms executing more or less independently on the different protocol layers, a single unified optimization is performed." Moreover, routing, channel access, physical layer functions and admission control are integrated into a single, unified mechanism by using

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connection parameters including path, channel and one or more physical layer/link parameters.

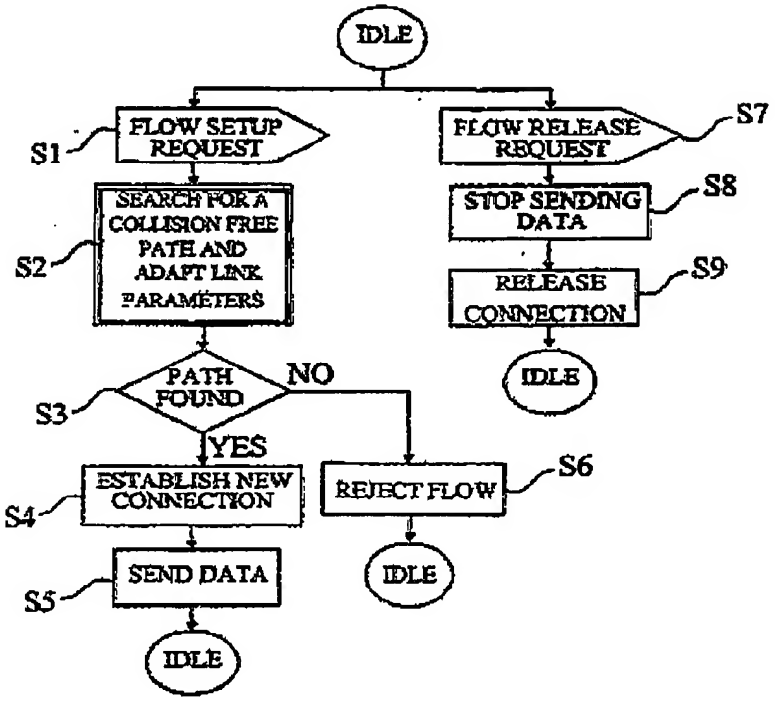

Fig. 4

The Examiner maintains that Larson et al. teaches establishing a QoS threshold at an upper protocol layer as recited in the above-noted independent claims. As support, the Examiner cited paragraph 0179, lines 13-14 of Larson et al., which set forth that "when a new connection set-up is attempted, the optimisation [sic] of the objective function (or the algorithm) is performed with respect to multiple data rate requirements (given by the application layer)." The Examiner contends that this adaptive application somehow

constitutes establishing a QoS threshold as recited in the above-noted independent claims.

In the prior Response, Appellants argued that Larson et al. fails to teach or fairly suggest establishing a QoS threshold at an upper protocol layer. In particular, Appellants noted that the text cited by the Examiner (i.e., paragraph 0179, lines 5-14) discusses an adaptive application running on the application layer (e.g., a video or voice-based application) that maintains a particular level of application quality despite being used with different data rates. Appellants emphasized that this is different than establishing a QoS threshold that pertains to route quality.

In response, the Examiner now implies that Larson et al. inherently teaches the recitation of establishing a QoS threshold. More particularly, the Examiner (Final Office Action, page 4) states that QoS routing protocols in ad hoc networks are designed to set up a path from a source node to a destination node based upon some requirement regarding bandwidth or delay to be able to support real-time multimedia applications.

In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. As the Examiner is aware, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical

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invention must be shown in as complete detail as is contained in the claim.

It is respectfully submitted that the Examiner mischaracterized the actual teachings of Larson et al. Indeed, Larson et al. is concerned with optimization over the network (e.g. Abstract). This is not establishing a QoS threshold that pertains to route quality. In other words, the Larson et al. system and method may result in an optimized or "best path" being determined, but that path does not necessarily meet an established threshold and there are no guarantees of quality.

Furthermore, as evidence that the Examiner has not carefully considered the features of the entire claimed invention, Appellants point to the Examiner's assertion in the Advisory Action mailed December 12, 2005. Therein, the Examiner asserts that "'establishing a QoS threshold that pertains to route quality' is not described in an original claim." The Examiner's interpretation of the claim language is incorrect. Indeed, each of the independent claims, for example, recites determining the QoS metric for the at least one selected route and determining whether a QoS metric for at least one selected route...falls below the QoS threshold. Thus, in contrast to the cited reference, the claims of the present invention are clearly directed to a QoS threshold that pertains to route quality.

The above-noted independent claims recite that at at least one intermediate protocol layer below the upper protocol layer a determination is made whether a QoS route metric for a selected route(s) falls below the QoS threshold. Moreover, at a lower protocol layer, signal reception gain or pattern is

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adjusted based upon a determination that the QoS metric has fallen below the QoS threshold.

Nothing in Larson et al., let alone the portions cited by the Examiner, explicitly or inherently teaches that a QoS threshold is established at an upper protocol layer, and that the established QoS threshold is used in an intermediate protocol layer determination and for adjusting signal reception gain or pattern at a lower protocol layer. Accordingly, it is respectfully submitted that independent Claims 1, 7, 12, and 18 are patentable over the prior art. Their respective dependent claims, which recite yet further distinguishing features, are also patentable over the prior art and require no further discussion herein.

CONCLUSIONS

In view of the foregoing arguments, it is submitted that all of the claims are patentable over the prior art. Accordingly, the Board of Patent Appeals and Interferences is respectfully requested to reverse the earlier unfavorable decision by the Examiner.

Respectfully submitted,

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APPENDIX A - CLAIMS ON APPEAL FOR U.S. PATENT APPLICATION SERIAL NO. 10/658,357

1. A mobile ad hoc network (MANET) comprising:

a plurality of mobile nodes each comprising a wireless communications device and a controller connected thereto;

said controller operating in accordance with a multi-layer protocol hierarchy for,

at an upper protocol layer, establishing a quality-of-service (QoS) threshold;

at at least one intermediate protocol layer below the upper protocol layer, determining whether a QoS metric for at least one selected route from at least one source mobile node falls below the QoS threshold; and

at a lower protocol layer below the at least one intermediate protocol layer, cooperating with said wireless communications device to

determine the QoS metric for the at least one selected route,

receive data from the at least one source mobile node via the at least one selected route, and

adjust signal reception gain based upon a determination that the QoS metric has fallen below the QoS threshold.

2. The MANET of Claim 1 wherein said wireless communications device provides an adjustable signal reception

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pattern; and wherein, at the lower protocol layer, said controller also cooperates with said wireless communications device to change the signal reception pattern based upon a determination that the QoS metric has fallen below the QoS threshold.

3. The MANET of Claim 1 wherein the upper protocol layer comprises an application layer.

4. The MANET of Claim 1 wherein the at least one intermediate protocol layer comprises at least one of a session layer, a transport layer, a network layer, and a radio transport layer.

5. The MANET of Claim 1 wherein the lower protocol layer comprises a physical layer.

6. The MANET of Claim 1 wherein the QoS threshold is based upon at least one of available bandwidth, error rate, end-to-end delay, end-to-end delay variation, hop count, expected path durability, and priority.

7. A mobile ad hoc network (MANET) comprising:

a plurality of mobile nodes each comprising a wireless communications device providing an adjustable signal reception pattern and a controller connected thereto;

said controller operating in accordance with a multi-layer protocol hierarchy for,

at an upper protocol layer, establishing a quality-of-service (QoS) threshold;

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at at least one intermediate protocol layer below the upper protocol layer, determining whether a QoS metric for at least one selected route from at least one source mobile node falls below the QoS threshold; and

at a lower protocol layer below the at least one intermediate protocol layer, cooperating with said wireless communications device to

determine the QoS metric for the at least one selected route,

receive data from the at least one source mobile node via the at least one selected route, and

adjust the signal reception pattern based upon a determination that the QoS metric has fallen below the QoS threshold.

8. The MANET of Claim 7 wherein the upper protocol layer comprises an application layer.

9. The MANET of Claim 7 wherein the at least one intermediate protocol layer comprises at least one of a session layer, a transport layer, a network layer, and a radio transport layer.

10. The MANET of Claim 7 wherein the lower protocol layer comprises a physical layer.

11. The MANET of Claim 7 wherein the QoS threshold is based upon at least one of available bandwidth, error rate,

end-to-end delay, end-to-end delay variation, hop count, expected path durability, and priority.

12. A method for operating a mobile node in a mobile ad hoc network (MANET), comprising a plurality of mobile nodes, in accordance with a multi-layer protocol hierarchy, the mobile node comprising a wireless communications device, the method comprising:

at an upper protocol layer, establishing a quality-of-service (QoS) threshold;

at at least one intermediate protocol layer below the upper protocol layer, determining whether a QoS metric for at least one selected route from at least one source mobile node falls below the QoS threshold; and

at a lower protocol layer below the at least one intermediate protocol layer,

using the wireless communications device to determine the QoS metric for the at least one selected route,

causing the wireless communications device to receive data from the at least one source mobile node via the at least one selected route, and

causing the wireless communications device to adjust signal reception gain based upon a determination that the QoS metric has fallen below the QoS threshold.

13. The method of Claim 12 wherein the wireless communications device provides an adjustable signal reception

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pattern; and further comprising, at the lower protocol layer, causing the wireless communications device to change the signal reception pattern based upon a determination that the QoS metric has fallen below the QoS threshold.

14. The method of Claim 12 wherein the upper protocol layer comprises an application layer.

15. The method of Claim 12 wherein the at least one intermediate protocol layer comprises at least one of a session layer, a transport layer, a network layer, and a radio transport layer.

16. The method of Claim 12 wherein the lower protocol layer comprises a physical layer.

17. The method of Claim 12 wherein the QoS threshold is based upon at least one of available bandwidth, error rate, end-to-end delay, end-to-end delay variation, hop count, expected path durability, and priority.

18. A method for operating a mobile node in a mobile ad hoc network (MANET) comprising a plurality of mobile nodes in accordance with a multi-layer protocol hierarchy, the mobile node comprising a wireless communications device providing an adjustable signal reception pattern, the method comprising:

at an upper protocol layer, establishing a quality-of-service (QoS) threshold;

at at least one intermediate protocol layer below the

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upper protocol layer, determining whether a QoS metric for at least one selected route from at least one source mobile node falls below the QoS threshold; and

at a lower protocol layer below the at least one intermediate protocol layer,

using the wireless communications device to determine the QoS metric for the at least one selected route,

causing the wireless communications device to receive data from the at least one source mobile node via the at least one selected route, and

causing the wireless communications device to adjust the signal reception pattern based upon a determination that the QoS metric has fallen below the QoS threshold.

19. The method of Claim 18 wherein the upper protocol layer comprises an application layer.

20. The method of Claim 18 wherein the at least one intermediate protocol layer comprises at least one of a session layer, a transport layer, a network layer, and a radio transport layer.

21. The method of Claim 18 wherein the lower protocol layer comprises a physical layer.

22. The method of Claim 18 wherein the QoS threshold is based upon at least one of available bandwidth,

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error rate, end-to-end delay, end-to-end delay variation, hop count, expected path durability, and priority.

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Evidence Appendix

None

Related Proceedings Appendix

None

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